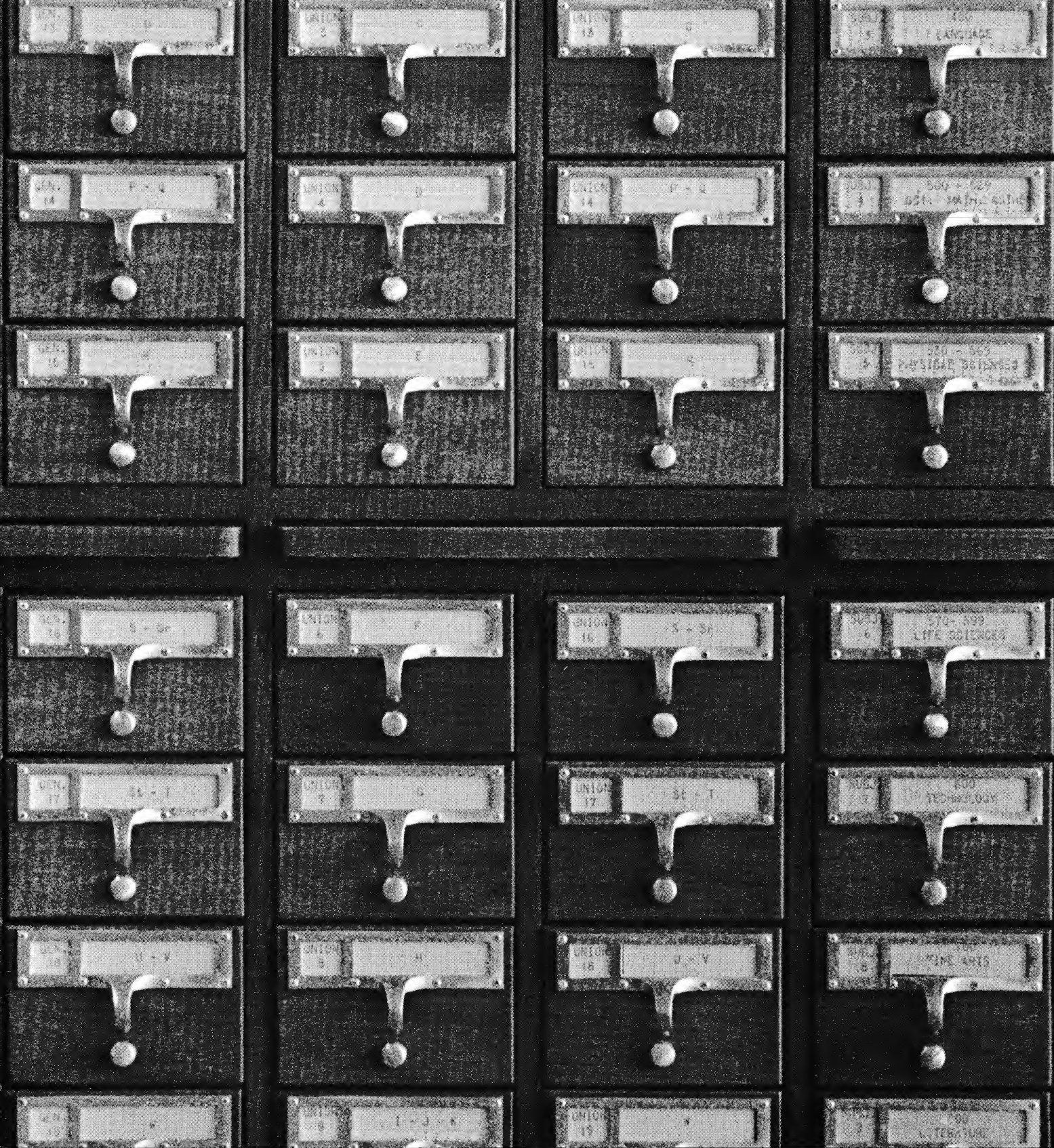






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- 631.45 **Bennett, Hugh Hammond.** Elements of soil conservation. 2d ed. McGraw, c1955. 358 p. Maps.

SOIL FERTILITY

- 631.45 **Cook, Ray Lewis.** Soil management for conservation and production. Wiley, c1962. 527 p. Illus.
- 631 **Millar, Charles Ernest.** Soil fertility. Wiley, c1955. 436 p. Illus.
- 631 **Thompson, Louis Milton.** Soils and soil fertility. 2d ed. McGraw, 1957. 451 p. Illus., maps. (McGraw-Hill publications in the agricultural sciences)
- 631.2 **Tisdale, Samuel L.** Soil fertility and fertilizers by Samuel L. Tisdale and Werner L. Nelson. Macmillan, c1956. 430 p. Illus.

SOIL FORMATION

- 631.4 **Orni, Ephraim.** Geography of Israel, by E. Orni, E. Efrat. Ed. by Y. C. Segal. Israel Program for Scientific Translations, 1964. 335 p. Illus., maps. Bibliography.

SOIL HEATING

- q621.3 **National Rural Electric Project.** Electric hotbeds, cold-frames, propagating benches and open heating, Section 1, Recommended construction and use. 1932. 8 p. Illus. (its Report no.5)

SOIL MECHANICS

- 620.19 **American Society for Testing Materials.** Papers on soils, presented at the second Pacific area national meeting, Los Angeles, Calif., September 17, 1956. c1957. 178 p. Illus. (ASTM special technical publication no.206)
- 620.19 **American Society for Testing Materials.** Procedures for testing soils; nomenclature and definitions, standard methods and suggested methods. 3d ed., c1958. 544 p. Illus.
- 625.73 **Brown, Victor Jacob.** Soil stabilization, after C. A. Hogentogler gillette, 1939. 141 p. Illus.
- 624.151 **Collin, Alexandre.** Landslides in clays, 1846; translated by W. R. Schriever with the assistance of J. P. Carriere, R. F. Legget, and D. H. MacDonald. With a memoir on Alexandre Collin, by A. W. Skempton. University of Toronto Press, c1956. 160 p. Port.
- 624.1 **Huntington, Whitney Clark.** Earth pressures and retaining walls. Wiley, c1957. 534 p. Illus.
- 553 **Reynolds, Henry Raymond.** Rock mechanics. Ungar Pub. Co., c1961. 136 p. Illus.
- 620.19 **Spangler, Merlin Grant.** Soil engineering. International Textbook Co., 1953, c1951. 458 p. Illus. (International textbooks in civil engineering)

SOIL MICRO-ORGANISMS

SOIL POLLUTION

- qR610.5 **Kligler, Israel Jacob.** Investigation on soil pollution and the relation of the various types of privies to the spread of intestinal infections. Rockefeller Institute for Medical Research, 1921. 75 p. Illus. (Monographs of the Rockefeller institute for medical research. no.15. Oct. 10, 1921) 68 Monograph no.15. Published for the International health board.

SOIL SURVEYS

- 631 **Clarke, George Robin.** Study of the soil in the field. 1936. 142 p.
631 *Ore. **Powers, Wilbur Louis.** Land classification and soil and water surveys. St. Joseph, Mich, 1935. 8 p. Illus.

SOIL-SURVEYS - THE WEST

- 631.478 **Western States Land-Grant Universities and Colleges. Agricultural Experiment Stations.** Soils of the western U. S. (exclusive of Hawaii and Alaska). A joint regional publication by the Agricultural Experiment Stations of the Western States Land Grant Universities and Colleges, with cooperative assistance by the Soil Conservation Service. Wash. State Univ., 1964. 69 p.

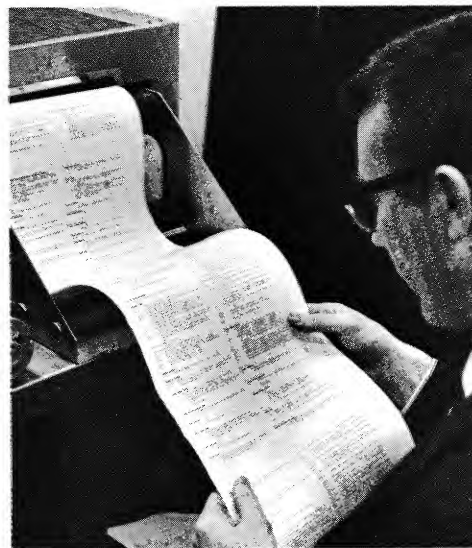
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- 631.4 **Thorne, David Wayne.** Irrigated soils, their fertility and management, by D. W. Thorne and H. B. Peterson. Blakiston, c1949. 288 p. Illus., ports., map.

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631 **Baver, Leonard David.** soil physics. 3d ed. Wiley, c1956. 489 p. Illus.
631 **Bear, Firman Edward.** Earth, the staff of life. University of Oklahoma, c1962. 238 p.
631 **Bear, Firman Edward.** Soil management. 2d ed. thoroughly rev. and enl. second printing, corrected. Wiley, c1931. 412 p. Illus.
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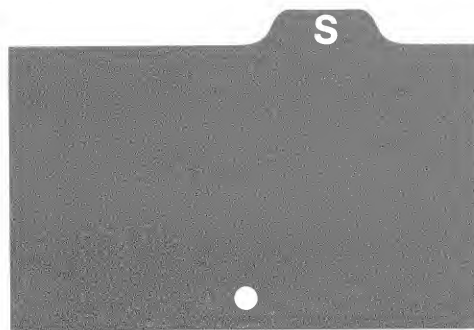
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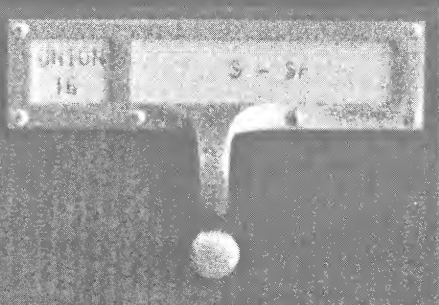
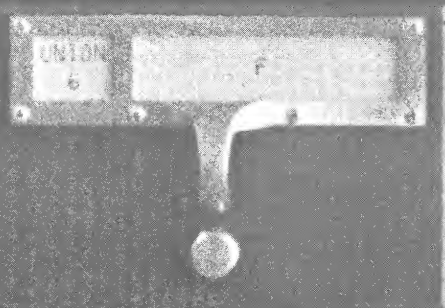
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0413	E 1366266	.45	.30	.23	--	9798	E 1366284	.15	.10	.08	--
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0439	E 1366242	2.15	3.20	1.29	--	4046	E 1366275	1.45	1.16	.87	--
10261	E 1366242	4.00	3.20	2.40	--	5395	E 1366279	.45	.36	.27	--
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9798	E 1366284	.15	.10	.08	--	9260	E 1366274	.12	.08	.06	--
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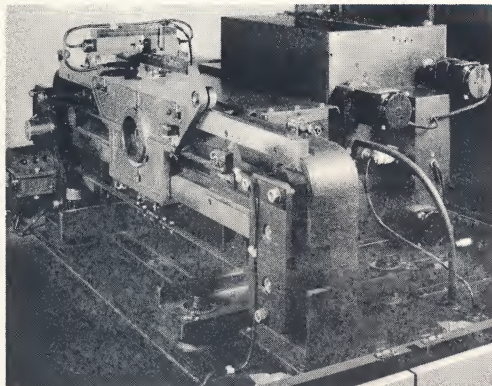
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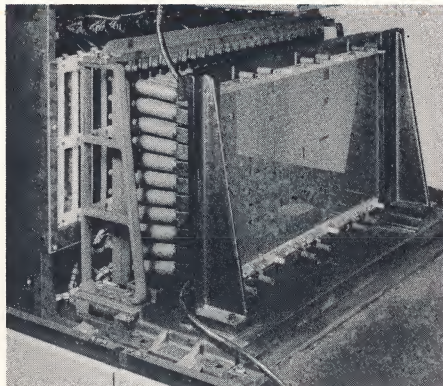
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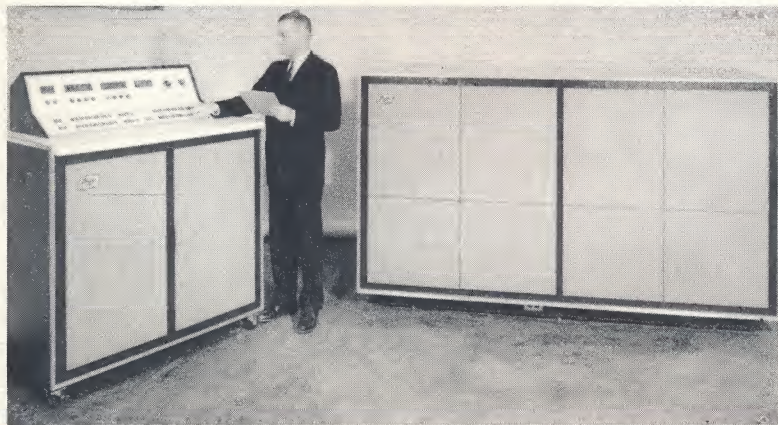
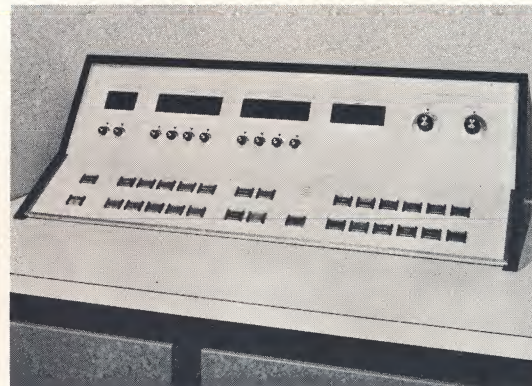
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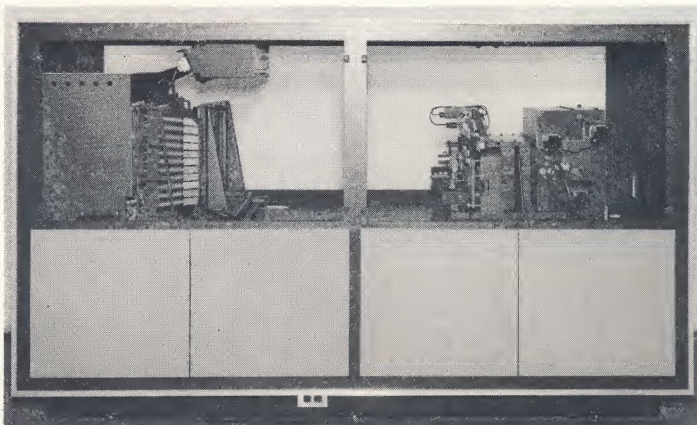
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New York, New York 10021

Directories: Natural Market for Phototypesetting

The same computer that drives today's ultrafast phototypesetting units can store and manipulate all kinds of data. Here's how one firm uses such a system.

by Henry D. Sedgwick

THE INTRODUCTION of the digital computer as an aid to typesetting operations had the same impact on the graphic arts industry as it did in every other field in which computer usage has developed.

At the outset, its benefits were oversold by its proponents with the reaction from the buying community of everything ranging from wild, uninformed enthusiasm to total disbelief and refusal to listen.

The major factor retarding the development of the use of the computer in typesetting has been the communications gap between the computer world and the graphic arts world. Computer technology is a development of the second half of the 20th century, while graphic arts has been around since the cave man first recorded his surroundings on the walls of his cave.

The computer man looks on the printer as a backward practitioner of an ancient art, his practices archaic, his methodology obsolete.

The printer regards the computer man as an overconfident brash youth or a magician whose tricks should be evaluated in a "Alice-in-Wonderland" environment rather than one of basic economics and common sense.

In spite of this difficulty, computer usage is developing in an ever-increasing rate in two broad areas.

First, a computer can be used to justify and hyphenate lines of straight matter in book, magazine, and newspaper setting. Here the variables of production—volume, the number of keyboard operators, and the cost of the computer—determine whether or not a computer should be used.

If the printer operates 20 keyboards at a direct-labor cost of \$10,000 per month, he can increase their output by approximately 30% for a computer cost of approximately \$1,000 per month, with no additional keyboard personnel. Provided that he has the increased production requirement on a continuing basis, he is ahead \$2,000 per month by using a computer instead of hiring six more keyboard operators.

There is a wide variety of computers on the market with programs already written to do the job of justification and hyphenation. Some are designed to do only this, while others have more general-purpose capabilities and may be used to do other jobs for a printer, such as payroll, cost systems, etc.

The second area, and by far the most significant, is the use of a computer to store and manipulate information for a directory, price or parts list, abstract, or any publication that must be periodically updated and published.

In this instance, the computer when properly programmed will produce a

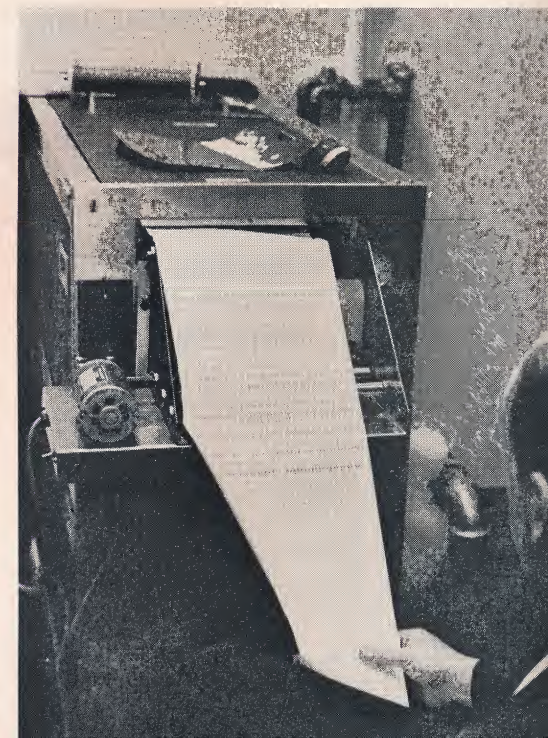
magnetic tape with all the information properly sequenced and listed, with the appropriate function codes to instruct a phototypesetting device to deliver a fully made-up page with all type elements in position on paper or film positive. Such a system offers vast economic and time advantages over the old stored-metal, manual-update method.

Our service operation utilizes the Photon 901 system for this function. Using this system with the appropriate computer, we are able to update and set type on 10,000 pages of directories in just 20 working days from the time the publisher furnishes the final revised material. A system like this costs some \$300,000 just for the typesetting, film processing, and support equipment alone. However, it has an annual capacity of setting some 400,000 80-line pages.

Since there are few printers or publishers who set or update that many pages of directories per year, it is a natural service organization function. It must be pointed out that a system of this kind, at this point in time, is appropriate *only* for directory work, with a standard page format that must be updated periodically and published, and is at least 200 or 300 pages per publication. For such applications, the computer linked to the high-speed phototypesetting device is an unbeatable combination.

A decision to use a computer to aid in the storage and updating of a directory must be based on the cost factors of data recording, computer programming, computer processing, and high-speed typesetting, compared with the cost of the current production method

Below, an automatic photo processor delivers paper positives with photo-produced type exposed.



used. Data recording is the means by which the information in the directory is converted to computer-readable form, *i.e.*, either keypunch or tape perforation.

A computer program must be written to instruct the computer on what it is supposed to do with the material: alphabetize, arrange in a certain sequence, edit by eliminating outdated material, and updating it with current information, format, and paginate.

Through the combined operations of the keypunch, the program, and the computer, a tape is prepared that will direct a high-speed phototypesetting device which, in the case of our system, can set an 80-line page with a three-column format in 36 seconds or less.

Now this is all very impressive, but since the computer program itself can cost from \$5,000 to \$50,000, depending on its complexity, it makes little sense to put a 50-page directory into such a system. The programming can cost as much for a 50-page directory as for a 50,000-page directory.

There is a further factor to be considered in making a judgment as to whether or not to move from a manual-update system into a computer system. A directory is a bank of data; information which can be used in a number of different ways to be marketed in numerous products.

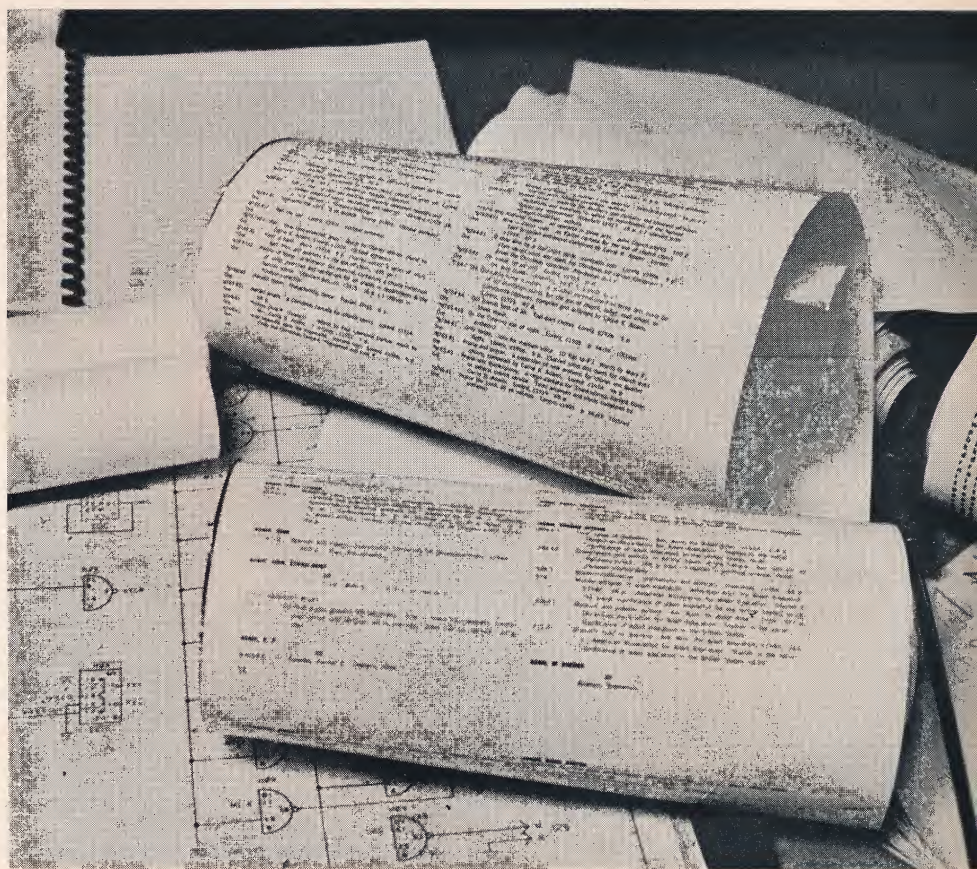
For example, the data in a directory can be set up as a mailing list. Smaller directories with particular information, interesting to a specific market, can be pulled from the master directory. All this can be easily achieved with the flexibility and high speed of a computer system.

In a manual-update system, the production of sub-directories or any other use of the information than the printing of it in the traditional directory format is too time consuming and costly.

Once a directory is in the computer, the only practical way to prepare the information for press is to link the computer's ability to prepare a final tape with all data and format information thereon to run a high-speed phototypesetting system.

The use of the computer is bound to affect the structure of the graphic arts industry. When used as a means of increasing output on straight-matter keyboards by justifying and hyphenating lines of type, the computer will become another production aid in existing typesetting, printing, and newspaper plants.

In the second area, that of information storage and retrieval, service companies such as our own will offer the full range of keyboarding, programming, computer processing, and high-speed typesetting.

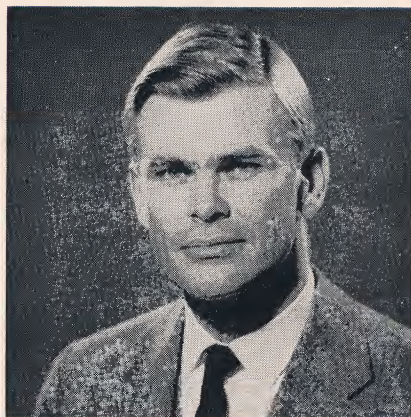


Photograph above shows phototypeset pages in roll form.

Some of the very large printers and publishers will install their own equipment, but as I pointed out previously, the cost is high and the volume required to support that high cost is enormous.

As computer techniques and high-speed typesetting equipment become more sophisticated, yielding greater speeds, greater typographic flexibility, higher quality, and increased page-make-up capabilities, more and more of the textbook, trade book, magazine, and perhaps even newspaper typesetting will be taken over by computer graphics oriented service groups. This development is going to happen over a long period of time.

There is a great deal of dreaming going on, some of it realistic and some of it not so realistic about what the future will bring in new technology. In making a judgment as to how soon any of this will become useful, we must heed the lessons of the last 10 years. It takes a lot longer to coordinate man with machine than machine with machine. It has been only during the last four or five years that the computer has been recognized as a useful implement in the typesetting field, although the technology to do the job has been there for at least 12 years. Man is wedded to his habits, procedures, and work patterns, and change, as we have seen, is agonizing.



About the Author

Henry D. Sedgwick was founder and chief executive of Foto Comp, Inc., New York City-based typesetting service. He has also been manager of Simulmatics Corp., a company engaged in research into the behavioral economic and marketing sciences, using computer-based techniques. He recently formed Sedgwick Printout Systems, Inc., New York, which offers high-speed phototypesetting facilities to computer users whose output is processed in printed form for wide distribution. The service is offered nationally. Mr. Sedgwick is a graduate of Harvard.

The New York Times.

Photocomposition Gains a Focus

By WILLIAM D. SMITH

Photocomposition, the latent giant of printing, is beginning to throw its weight around.

Like Gulliver breaking the tiny twines that bound his body in Lilliput, phototypesetting is making its presence felt throughout the many diverse segments of the printing business.

Photocomposition is the first major innovation in printing devices since the linecaster was introduced in the 19th century. The process replaces the traditional casting of molten metal slugs with the optical projection of characters onto photosensitive film or paper.

No Revolution

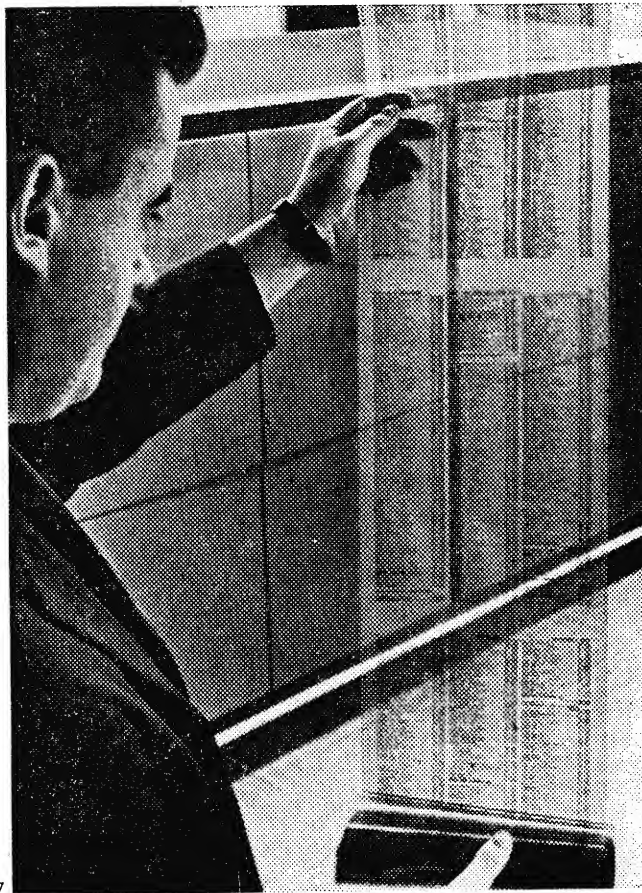
When the Harris-Intertype Corporation introduced the first practical phototypesetting device in 1949, many industry pundits predicted that the new process would quickly revolutionize printing.

Since only about 10 per cent of the typesetting devices presently in use are photocomposition machines, a revolution obviously has not taken place. Nonetheless, by the end of the century most industry sources expect photocomposition devices to make up the great bulk of the typesetting machines in use.

Photocomposition offers many obvious advantages. First is the flexibility of character size and font. The second is speed. According to all informed sources, metal typesetting has gone as far as it can go at a rate of about 10 characters a second under fully automated conditions. Speeds of 10,000 a second are not unlikely within several years by use of photocomposition methods.

The element that is common to all high-speed photocomposition devices is that they are designed to be used with computers. In fact, they cannot be used without electronic data processing.

In recent months, the gradual advance of phototypesetting has speeded up.



The New York Times (by Neal Boenzi)

A staff assistant at New York Telephone Company office, 100 Church Street, examining film from photon machine used to print directories. Each section prints one page.

Probably the most significant event was the New York Telephone Company's use of a photocomposition device to set the Staten Island Telephone Directory. The company used a computer-driven Photon 901 machine, made by Photon, Inc., of Wilmington, Mass., to turn out the book at a rate of one page a minute. This is a rate 100 times faster than the quickest automated hot-metal linecaster in use.

In addition to being quicker, the phototypesetter saved money and permitted far more efficient updating of new listings. Instead of having to linecast each new number and pull from a room full of slugs each delisting, all information was fed into a computer and stored on magnetic tape. When the day for printing came, the more than 80,000 up-to-date listings for the book were contained on two reels of tapes, compared with more than two tons of somewhat behind-the-time metal slugs.

Only the computer is fast enough to feed information to typesetters with the speed of the new photocomposition devices. Only the computer can retrieve information with the speed and accuracy necessary for certain printouts.

Phototypesetting and electronic data processing have made a marriage both of convenience and of necessity. The first applications have been in publications that need constant updating of information on a basic data mass such as the telephone directory, parts catalogues and medical abstracts.

Small Company Acts

A small company in New York, Sedgwick Printout Systems, Inc., has already seen the opportunities in the area and is selling time on a Photon 900 system to commercial customers in need of high-speed typesetting. The customers will bring in their own computer tapes and the Photon will set the type.

One major area of difficulty is the preparation of instructions for the computer composition of publications, although concerns such as Rocappi are making considerable progress in this area.

Most informed sources contend that there will be a considerable number of high-speed phototypesetting machines sold in the next five years. The sales will not only be to printing concerns but to any large organization that needs volume printing, such as aerospace corporations and Government agencies.

In many of these operations, the typesetting device will be hooked up as an output machine.

The information explosion is upon us and the high speed phototypesetter seems to be in an excellent position to pick up its economic boom.